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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,465	07/11/2006	Joel B. Christian	07194.0111U2	1924

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Ballard Spahr LLP
SUITE 1000
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EXAMINER	
HAN, KWANG S	
ART UNIT	**PAPER NUMBER**
1795	

MAIL DATE	DELIVERY MODE
04/27/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/550,465	CHRISTIAN, JOEL B.	
	Examiner	Art Unit	
	Kwang Han	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/8/10*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

TUNGSTEN-BASED ELECTROCATALYST AND FUEL CELL CONTAINING SAME

Examiner: K. Han SN: 10/550,465 Art Unit: 1795 April 27, 2010

Detailed Action

1. The Applicant's amendment filed on February 8, 2010 was received. Claim 10 was amended.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Christian et al. in view of Broyde et al. on claim 10 is withdrawn, because claim 10 has been amended.

4. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Christian et al. in view of Broyde et al. as applied to claim 10 and further in view of Broyde et al. on claims 11-16 is withdrawn, because independent claim 10 has been amended.

5. Claims 10 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marucchi-Soos et al. (US 5922488) in view of Christian et al. (US 2002/0111267).

Regarding claim 10, Marucchi-Soos discloses a fuel cell comprising an anode which comprises an electrocatalyst of a hydrogen tungsten bronze [Abstract] (3:23-33) and further recognizes that the hydrogen tungsten bronze electrocatalyst are suitable for reducing O_2 at the cathode of a fuel cell (3:2-14) but does not explicitly teach the cathode to comprise the hydrogen tungsten bronze.

Christian teaches that typical PEM based fuel cells use the same platinum based electrocatalyst in both the anode and cathode of the fuel cell [0021-0022]. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the same electrocatalyst within the cathode of Marucchi-Soos because Marucchi-Soos recognizes the hydrogen tungsten bronze is suitable for reducing oxygen at the cathode and Christian teaches typical PEM based fuel cells use the same electrocatalyst in both the anode and cathode of the fuel cell.

Regarding claim 12, Marucchi-Soos discloses the W/Pt weight ratio to be between 3 to 0.1 and affects the CO oxidation teaching the ratio to be a result effective variable (7:61-8:6). It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the W/Pt weight ratio since it has been held that discovering the optimum ranges for a result effective variable such as a weight ratio involves only routine skill in the art in the absence of showing of criticality in the claimed range (MPEP 2144.05) In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 13-16, Marucchi-Soos discloses a PEM type fuel cell which uses hydrogen as a fuel and air as an oxidant with a polymer membrane (6:5-52) but does not explicitly disclose the polymer membrane to be a perfluorosulfonic acid polymer.

Christian teaches that a typical solid polymeric electrolyte material used in a PEM based fuel cell includes a perfluorosulfonic acid polymer such as Nafion [0005]. It would have been obvious to one of ordinary skill in the art at the time of the invention to a perfluorosulfonic acid polymer as the polymer membrane because Christian teaches

this a well known and typical material used for the membrane which allows for proton conduction.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marucchi-Soos and Christian et al. as applied to claim 10 above, and further in view of Tseung et al. (US 5470673).

The teachings of Marucchi-Soos and Christian as discussed above are herein incorporated.

Regarding claim 11, Marucchi-Soos discloses a carbonaceous support for the electrocatalyst, the value of x in the hydrogen tungsten bronze (H_xWO_3) to be from about 0.05 to 0.36 (3:23-30) and Christian discloses the fuel cell catalyst to be dispersed on carbon black [0024] but is silent towards the tungsten based catalyst to be $H_{0.53}WO_3$.

Tseung teaches a fuel cell catalyst (1:8-17) comprised of the formation of hydrogen tungsten bronze (H_xWO_3) where $0<x\leq1$ (1:29-39; 8:4-8) increases catalytic activity as compared with conventional catalysts and is less susceptible to poisoning. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a catalyst with the formation of a hydrogen tungsten bronze material as defined by Tseung in the fuel cell of Marucchi-Soos and Christian because Tseung teaches it increases catalytic activity as compared with conventional catalysts and is less susceptible to poisoning.

Response to Arguments

7. Applicant's arguments filed February 8, 2010 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

(a) the Group VIII metal containing catalyst of Tseung is sufficiently different from the electrocatalyst of the present invention that consists essentially of a hydrogen tungsten bronze based catalyst.

In response to Applicant's arguments, please consider the following comments:

(a) the Tseung reference teaches the tungsten oxide catalyst reaction provides for the formation and presence of the hydrogen tungsten bronze in the catalyst (7:15-8:19) and meets the limitations of the claims which does not exclude the presence of a Group VIII metal.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang Han whose telephone number is (571) 270-5264. The examiner can normally be reached on Monday through Friday 8:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. H./
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795